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Bruising Causes Cherry Discoloration

The downgrading of processed products as a result of this offers a serious problem.

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ON a hot summer afternoon a visitor at a processing plant for red cherries usually notices that some cherries are unevenly spotted and discolored. Sometimes the discolored areas are present before the cherries are dumped into the soaking tanks; at other times the areas make their appearance shortly after the soaking period begins.

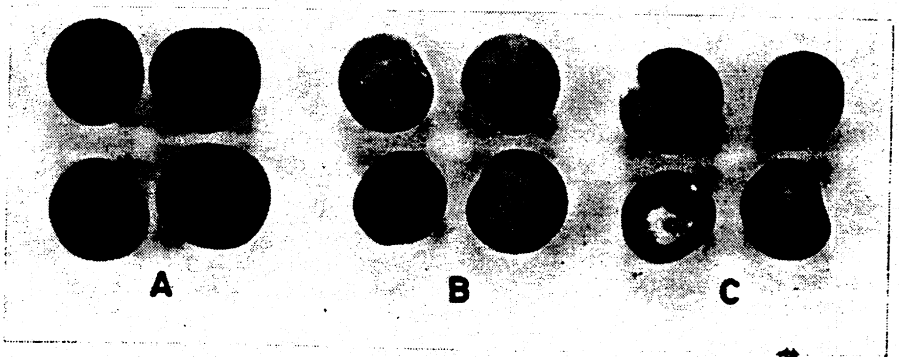
At first the areas show up as a mild paling or pinking of the cherry surface. Gradually the areas change to light tan, tan, and finally to brown, giving the appearance of rot. Processors naturally are concerned about this discoloration, since it frequently leads to a downgrading of the processed product. In general, the discoloration is more serious with frozen fruit than with heat-processed fruit.

Scald Blemishes

The connection between the discoloration and prolonged delays at relatively high temperatures during the harvest period has been observed for a long time, and the discolored areas commonly are called scald blemishes. Some steps have been taken to diminish the intensity of the discoloration. In many cases cherries are placed in the shade in lugs immediately after being picked; picking may be stopped during the hottest part of the day; cherries sometimes are placed in cool water in tank trucks in the orchard; frequent trips to the processing plant may be made, and ice may be used in the soaking tanks. In general, efforts are made to handle and to cool the cherries as promptly as possible. Despite these efforts, discoloration does occur and many questions concerning the subject remain unanswered.

A rather simple laboratory experiment helps to answer some of the questions (see Table). If cherries are picked very carefully and put in a dry glass jar, they will not become blemished even if held for two or three days at 90 deg. Fahr. If, however, similar cherries are bruised purposely and are then given the same storage treatment, blemishes appear within four or five hours. The blemishes show first in places where the cherries touch each other or the walls of the jar. In general appearance the cherries eventually become similar to fruit known in commercial practices as "lug-scalded" or sun-scalded." In the present case cherries were bruised by being dropped three times from a height of three feet onto a metal tray. This amount of bruising was equivalent to that commonly incurred by fruit during commercial handling. The cherries were softened but their skins were not broken.

If unbruised cherries are put



SURFACE DISCOLORATION of cherries: *A*, Unbruised cherries do not discolor in air at 90 deg. Fahr. *B*, Bruised cherries become pale when soaked in water at 90 deg. Fahr. *C*, Bruised cherries develop discolored areas when stored in air at 90 deg. Fahr.

"Serious blemishes appear on red cherries on hot days"

in water instead of air and stored at 90 deg. Fahr., they remain unchanged in appearance for one or two days. However, if the cherries are bruised and then soaked, loss of red pigment from the bruised tissues is noticeable within four or five hours. The cherries become generally pale and somewhat mottled.

Stable at 35 deg.

Holding cherries in either air or water at 75 deg. Fahr. gives results similar to those obtained at 90 deg. Fahr., with the exception that responses of the cherries to the treatments are slower. At 35 deg. Fahr., however, the cherries are relatively stable. For example, unbruised fruits in air at this temperature stay unspoiled and unblemished for 10 or more days, and bruised fruits keep well for two or three days.

This experiment has been repeated many times over a period of years with cherries grown under varied cultural conditions. Fruit from Michigan, New York, and Pennsylvania has been used. Although some lots of cherries are softer, bruise more easily, and discolor more quickly than do other lots, in general all cherries respond to the treatments in a similar manner.

Bruising of cherries, then, is the primary cause of surface discoloration. A surface blemish is really a bruise mark. If bruising occurs through natural causes while cherries are on the tree, the resulting blemishes are known as windwhip scars, limb-rub defects, or hail marks. If bruising occurs during picking or rough handling, the resulting discolorations are known as scald blemishes. The ultimate appearance of the latter blemishes depends largely on the extent of bruising, temperature, and length of the storage or soaking period.

SCENE IN CHERRY ORCHARD at harvest time. Considerable bruising of cherries occurs during picking and handling. Afternoon temperatures in the nineties, common in some localities, often cause scalding.

Control of Blemishes

It is possible, therefore, to inhibit scald blemishes by controlling the temperature, length of delay, and bruising, of harvested cherries. In laboratory experiments bruised cherries can be prevented from scalding by maintaining a sufficiently low temperature. As a practical matter, however, adequate control over temperature or the length of delay is seldom achieved, and as yet little effort has been made to control bruising. Consequently, scald blemishes remain as a serious problem.

With the recognition of bruising as the primary factor causing scald, new means of control are suggested. Whether it is economically feasible to reduce bruising in commercial practice remains to be seen. Undoubtedly many refinements to reduce bruising can be made in the picking and handling of cherries. Because the most serious bruising occurs during the picking operation, research on gentler methods of picking seems desirable.

TABLE showing a laboratory experiment on the treatment of cherries.

EFFECT OF BRUISING, TEMPERATURES, STORAGE AND SOAKING ON SURFACE DISCOLORATION OF CHERRIES

Treatment of Cherries (24 hour period)	Condition of Cherry Surface	
	Unbruised	Bruised
Stored in air at 35°F.	No blemishes	No blemishes
Stored in air at 75°F.	No blemishes	Moderate blemishes
Stored in air at 90°F.	No blemishes	Severe blemishes
Soaked in water at 35°F.	No color loss	No color loss
Soaked in water at 75°F.	No color loss	Moderate color loss
Soaked in water at 90°F.	No color loss	Severe color loss